DOCUMENT RESUME

ED 260 612 HE 018 562

AUTHOR	Ohlsson, Rolf
TITLE	The Expansion of the Education Sector in Sweden During the 20th Century.
INSTITUTION	National Swedish Board of Universities and Colleges, Stockholm. Research and Development Unit.
PUB DATE	7 Mar 85
NOTE	21p.
AVAILABLE FROM	National Swedish Board of Universities and Colleges, R&D Unit, P.O. Box 45501, S-104 30 Stockholm, Sweden.
PUB TYPE	Reports - Descriptive (141) -- Collected Works - Serials (022)
JOURNAL CIT	Swedish Research on Higher Education; n4 1985
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	College Students; Demography; *Economic Factors; Education Work Relationship; *Engineering Education; *Enrollment Trends; *Foreign Countries; *Higher Education; School Business Relationship; Student Financial Aid; *Student Recruitment
IDENTIFIERS	*Sweden

ABSTRACT

Three investigations on quantitative changes in higher education in Sweden are described. In Anders Nilsson's dissertation, "Study Financing and Social Recruitment to Higher Education (1920-1976)," attention was focused on changes in college recruitment from 1920 until reforms in 1977; the effect of various college financing conditions on recruitment; and enrollment trends. Variations in enrollment of different social groups were considered, as measured by enrollment ratio from upper-secondary school (gymnasium) to higher education (universities). Lars Pettersson's dissertation, "Engineering Education and Capital Formation (1933-1973)," provides an historical explanation for the expansion in engineering education in Sweden against the background of the growth and transformation of the economy. Consideration was given to changes in the labor market for engineers that affected salaries and, thereby, the demand for engineering education. Rulf Ohlsson's study, "Higher Education and Demographic Change," analyzed the short- and long-term changes in the annual flow to higher education during 1923-1975. Enrollment ratios were constructed for different student groups (e.g., male students, female students, engineering students, foreign students). The variations in the flow to college were assessed using a human capital model. (SW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

Swedish Research on Higher Education

ISSN 0281-3408

ED260612

1985:4

CONCLUDED PROJECT

TITLE OF PROJECT

THE EXPANSION OF THE EDUCATION SECTOR IN SWEDEN DURING THE 20TH CENTURY

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

IN PROGRESS AT

Department of Economic History
University of Lund
Finngatan 16
S-223 62 LUND
Sweden
tel: +46 46 10 74 77

PROJECT LEADER

Associate Professor Rolf Ohlsson

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

National Board of Universities & Colleges

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

SUMMARY

In the beginning of the 20th century higher education was still considered to be rather exclusive. Higher education was a privilege for the few and closely linked to social status. Higher education functioned primarily as an instrument for the higher social groups to maintain their power and influence in the society.

80 years later higher education is totally different. University education is no more confined to a privileged few. A relatively large proportion of those registering at the universities for higher studies belong to lower social groups. Nor does university education automatically lead to power and influence.

HE 012562

National Board of Universities and Colleges
R & D unit

P.O. Box 45501
S-104 30 Stockholm SWEDEN

PHONE
+ 46 8 24 85 60

It is almost self-evident that this transformation which has also meant a drastic increase over time in the annual flow to higher education must be seen against the background of the overall societal transformation in Sweden during the 20th century. However, at first it is not possible to isolate any simple cause-effect relationship in this dynamic process. The quantative changes in education appear to be an integral part of a composite and complex process of development where some other constituent elements were improved living standards, structural changes in the economy, changes in labour market and business fluctuations as well as the demographic factors. Furthermore, the most important actors appear to have been the state, the business sector and the individuals (households).

In Sweden there have been surprisingly few studies where the longterm expansion in the flow to higher education has been related to the societal transformation. The process of expansion has primarily been studied by three different categories of researchers; sociology-oriented researchers who have chosen to look at the process of quantitative development against the background of the changes in social structure, institutional-oriented researchers concentrating on the political decision-making process who generally assume that the expansion in education has been politically planned, and lastly, empirical-oriented researchers who have described the main lines in the quantative process but whose analysis of the underlying causal relationships have been general and unprecise. This leads to two reflections:

1. Economic-historical analyses of the quantative changes in education are conspicuously lacking but for one exception (Eskil Ekstedt). There are, of course, economists who have analysed higher education

in its economic context (Ståhl, Ysander, Sohlman and others), but they have mainly been interested in the present situation and have based their studies on cross-section data, thus more or less lacking the time perspective. Wherever the time aspect has been considered it has generally been a matter of shorter periods.

2. Nor has there been an integrated analysis where different aspects in the composite process of development have been brought together. Here it must be noted that there are no such international studies either, partly because most countries lack relevant information for longer time periods.

METHODOLOGICAL AND THEORETICAL POINTS OF DEPARTURE

When the project started we believed that it would be possible to undertake and complete an intergrated analysis, according to (2) above, within a reasonable period of time. However, we soon discovered that Swedish historical statistics on education were far below the generally recognised high standard of the statistics within other areas. Therefore, at a quite early stage the project was empirically oriented in order to collect both published and unpublished material to enable the construction of long continuous time series; series on the number of students at different levels in the school system and with different background for each year during the period of investigation, series on wages for different occupational categories, etc.

Our preliminary empirical work was based on the following methodological and theoretical points of departure:

1. Emphasis on time perspective

For an economic historian it is natural to make use of long time series to get at the underlying causal relationships. Too narrow a time perspective has the inherent weakness that one focuses on the analysis of less relevant factors which have only short-term explanatory value. By using long time series, we can emphasize not only continuity and general aspects but also discontinuity and specific aspects in the development process.

2. The clear link between education and the economic factors

In the American economic literature of the 1960s and 1970s several theories and hypotheses on the function of education and its economic role in the society have been advanced. (Education as investment, education as consumption, education as sorting.) It is natural that in an economic historical study of the long-term quantitative changes in education the analysis is based on these theories and hypotheses which also guide the collection of relevant empirical material. Nevertheless, it is self-evident that these hypotheses must be modified when analysing the Swedish development.

3. Emphasis on the individual demand for education

The theories referred to above can be briefly characterised as theories of choice where it is assumed that the individual has to decide whether to undergo a certain eduation or not. Thus, it is reasonable to consider the changes in enrollment as a reflection of the changes in the individual demand for higher education and subsequently to determine the institutional frameworks and the economic, social and demographic factors which have influenced the level of and the fluctuations in this demand

RESULTS

Gradually three specific areas of investigation crystallized. Thereby it can be reasonably claimed that we abandonned the original aim of presenting a more composite and integrated analysis of the quantitative changes in higher education in Sweden during the 1900s. The investigations resulted in two doctoral dissertations and a book by the project leader as well as some articles. A brief description of the contents of the three main studies is given below.

I

In his dissertation, "Studiefinansiering och social rekrytering till högre studier 1920-76" (Study financing and social recruitment to higher education 1920-76), Anders Nilsson has studied 1) how the social recruitment to higher education has changed from 1920 until the higher education reforms in 1977, 2) how varying study financing conditions influenced the change in social recruitment, and 3) how this influenced the general expansion within higher education. However, the Swedish educational system is constructed in such a way that, to a large extent, the recruitment to higher studies was determined in lower and upper secondary schools. To facilitate the investigation it has been limited to variations in the enrollment, measured as enrollment ratio from upper secondary school (gymnasium) to higher education (universities) for different social groups.

In order to provide a background to the changes in the social recruitment to higher studies, the flow from different social groups to the gymnasium is also dealt with in a substudy (chapter 2). Here it is clearly shown that

the intensity of education (number of gymnasium students per 100 of the same age) varied markedly between different social groups. For instance, the social groups "academics" had an intensity of education of about 20 in 1920 while the corresponding figure for "workers" was 0,5. In 1960 the intensity education for these groups were 60 and 4 respectively.

The substudy also shows that the differences in the intensity of education between males and females, which were considerable during the 1920s and the 1930s, successively declined and had disappeared in all the social groups by about 1960.

The observed changes in the intensity of education could also, to varying degrees, be interpreted in terms of the changed economic prerequisites. The economic changes did not seem to play any role at all in the case of "academics". But the weaker the tradition of education within a social group - the greater the importance of the economic factors. Above all, the increasing wages for youths during the 1930s and the 1940s appear to have contributed to the fact that the education intensity was constant during this period for a majority of social groups. Furthermore, the study support programme which began after 1945 seems to have stimulated the enrollment, particularly in the case of youths from the lower social groups.

In the main section of the dissertation (chapters 3-5), the changes in enrollment ratio from gymnasium to higher studies for different social groups is analysed. The large changes that occurred are interpreted on the basis of the changes in economic prerequisites, i.e. study financing and labour market conditions for fresh graduates. Particular attention is paid to the state study financing policy, which was altered drastically during the period of study. A methodology is developed to attempt to measure

simultaneously the effects of study financing and labour market conditions during different periods. This is done by expanding the traditional internal rate of return concept to take into account the study financing conditions. Since these conditions differed markedly in case of students from different social groups (at least until the beginning of the 1960s) internal rate of return calculations can be used to approximately reconstruct the economic prerequisites at a certain time for students from different social groups.

The State study support policy can be devided into three phases; 1919 to 1950, 1950 to 1964 and 1965 onwards. During each of these periods a rather uniform study financing policy was pursued. On the other hand, the labour market conditions for fresh graduates changed within each period which enables a study of the effects of different economic changes on the enrollment rate to higher education.

During the first period (1919-1950), the state efforts in the field of study financing were limited. Our calculations indicate that a mere 3% of the beginners could take advantage of the most important measure, namely the interest-free study loan. For a large proportion of the students, the parents' ability to extend financial support was the decisive factor.

During this period the labour market conditions changed considerably for fresh graduates. There was a scarcity of manpower with higher education in the beginning of the 1920s. But the conditions worsened gradually and in the 1930s there was a surplus of academics. During the 1940s, on the other hand, the demand for academics increased again. These marked changes in the labour market also influenced the enrollment rate to higher education from gymnasium.

A detailed analysis of the study financing conditions for newly enrolled students in 1920, 1925, 1930 and 1935 shows that study financing during the period did not undergo obvious changes. Thus changes in the labour market exerted similar influences on the recruitment of students from different social groups.

The period 1950-64 can be characterised as the selective study support period. The state support was continuously expanded but loans and stipends were "means tested" against the parental economic status. Consequently, an increasingly number of students from low and middle income families could finance a major part of their studies through state support.

At the same time this period was characterised by a growing demand for all categories of manpower with higher education. On the whole, these changes led to a successive increase in the enrollment rate during the period. It is, however, evident that the increase was most pronounced in the case of groups who could take advantage of state support. Thus, the rate of increase during the 1950s was highest for students from farming and working class homes while a marked increase in the enrollment ratio can be observed around 1960 for students from the homes of officials. The state policy and a favourable labour market situaion resulted in diminishing differences in enrollment ratio between social groups until the middle of the 1960s.

A general study financing system, "study means" was introduced in 1965. In contrast to the earlier system, the study means is independent of the parental economic situation. The study means system meant a more secure access to necessary financing for students from relatively wealthy homes without worsening the situation for other students. On the other hand, the costs increased for many students since the study means is mainly comprised of loans. The

potential recruitment effects of study means became evident when the labour market situation for academics changed around 1970. Upto this moment the labour market was favourable and incurring debt during the study period was hardly considered a major problem. However, between 1970 and 1975 the labour market situation worsened considerably while at the same time the loan part of study means increased gradually. Consequently, from an economic point of view higher education became a risky affair. Our calculations show that the internal rate of return for an education of teachers in secondary schools decreased from 10 % towards the end of 1960s to 0-1 % in 1975.

Against such a background it is not surprising that the enrollment ratio decreased markedly. There were however large differences between social groups, with a big and rapidly decreasing ratio for students from workers' homes while the enrollment ratio remained relatively high in the case of students from academic homes. The increasingly weaker economic incentives to begin higher studies during the first half of the 1970s thus appears to have effectively contributed towards a more skewed social recruitment to higher studies.

II

In Lars Pettersson's dissertation, "Ingenjörsutbildning och kapitalbildning 1933-1973" (Engineering education and capital formation 1933-1973), the aim is to provide an historical explanation for the expansion in engineering education in Sweden against the background of the growth and transformation of the economy. The choice of engineers as the group for study is motivated by the fact that they constituted a key group in the industrial transformation and that the engineering education, compared to other upper secondary and post upper secondary educations, has had very direct links with the growth and transformation

process in the economy. For the project as a whole it was considered essential to select a group where these direct linkages were obvious and could be studied relatively directly. The strong professional orientation of engineering education and the probable direct linkages between labour market and educational market also motivated the choice of human capital theory as the analytical base. On this basis the first hypothesis could be formulated regarding the question why changes occurred in the demand for engineering education: if the profitability of engineering education increases, more individuals will demand the education in question.

In order to test this hypothesis, series for relative wages were constructed and internal rates of return calculated for engineering education. These clearly showed that the hypothesis could be verified. By and large, there was an upward shift in the demand for engineering education when the profitability of education increased and a downward shift when it decreased, although other factors were also important.

Next stage in the investigation was to study those changes in the labour market for engineers which affected the salaries and, thereby, the demand for engineering education. The analysis showed that there existed a complementarity between the physical capital formation within industry and the work performed by engineers. Thus, changes in the demand for engineering education could be indirectly related to the technical development and to capital formation in the society.

However, the changes on the supply side could not be ignored. Educational planning was, to a large extent, a matter of adjustment to the demand in the labour market for engineers. Nevertheless, educational planning contained other aspects which were autonomous in relation to

the development in the labour market. These aspects varied in strength.

An analysis and a description of the historical process is given in the dissertation subsequently. Here an attempt is made to combine the demand factors and the factors on the supply side in order to give an explanation for the observed changes in the flow to engineering education during 1933-1973.

The period 1933-37 experienced a modest expansion of engineers. However, the growth of demand in the educational market for engineers shows that the expansion of technical schools lagged behind due to the state financial situation. Thus the demand for engineering education increased considerably already by 1935.

In the period 1937-47, there was a large increase in engineering education. This was partly due to the fact that the war-time structural transformation strengthened the upward shift in demand for engineers in the labour market which was initiated by the technical-organisational changes and by the high volume of investments during the 1930s. This also influenced educational planning and the expansion of engineering institutions.

During 1947-53 engineering education stagnated which coincides with the fact that the industrial capital formation declined after 1947. Housing construction as well declined after 1948. Thus the profitability of engineering education was low and neither the individuals nor the business sector was particularly interested in that education. The interest of the educational planning authorities was also low. The 1948 report of technical experts gave priority to quality before quantity and was generally reluctant to support an expansion.

During the period 1953-61 the number of new students at technical colleges increased again. A demand surplus for engineering education was maintained throughout the period implying that the expansion of technical institutions determined the rate of expansion. The most important factors behind the expansion were the formulated and rapidly growing needs of the market, primarily industry and defence. This need was a result of the extensive capital formation and the rapid technical change where rearmament played an important role. The formulated need also contained an element of "transfer", i.e., the private sector recognised the possibilities for shifting a part of its costs of education over to the public sector. Industry's demand was also (mixed) with the need for expansion felt by the local political interests. However, an expansion could be sufficiently motivated to satisfy, in the short-term, the demand for engineering education from the individuals. The major force behind this growth in demand was also a result of the industrial capital formation - linked to the education market through the increased profitability of engineering education.

The upward swing in the number of new students continued during 1961-66 and it was still the educational planning which put a ceiling for the enrollments. However, a substantial number of new colleges were established during this period. Some of the factors behind this expansion were an increased awareness among politicians that education was an investment as well as the need to provide professional education to the large age cohorts.

However, we have to explain how the demand surplus continued to exist despite the substantial expansion and despite the fact that the profitability of engineering education stagnated and subsequently declined. One explanation is that the expansion created new demand in areas which previously lacked technical education at the upper

secondary school level. Moreover, the rate of return of engineering education during a larger part of the period was still relatively high though it stagnated or was declining. Above all, however, the demographic factors played a role in many ways. The number of possible applicants to upper secondary schools grew very rapidly during the first half of the 1960s due to the fact that the age cohorts were unusually large and the secondary school reforms were in full effect.

During 1966-72 new enrollment stagnated but exhibited substantial cyclical variations. New enrollments were determined mainly by the individual demand for engineering education. The decline in demand can be partly explained by the same factors which determined a general decline in the demand for upper secondary school education; demographic factors and the expansion of two-year courses in secondary education. However, the decline was also related to a declining profitability of engineering education which, in turn, was dependant upon a substantial decline in the volume of industrial investment.

On the basis of the results arrived at, the concluding part of the dissertation is devoted to a discussion of the role of engineers and engineering education in the economic crisis of the 1970s. Demand for the traditional Swedish commodities stagnated in the beginning of the 1970s. But during a crisis the prerequisites for a new expansion are also created. As in 1950, there was a reserve of engineers holding relatively low positions and with relatively low salaries which could have been a good precondition for an anticipated boom. If the situation was comparable to the one in the beginning of the 1950s, new technologies and branches could now have expanded on a large scale. However, this was not the case. One contributing but not decisive factor was that the engineers with relatively low salaries around 1970 had wrong qualifications. Scientific and technical innovations, changed

pattern of demand and other factors once again created possibilities for a new upswing, but the mechanical and construction engineers did not suit well now since the complementarity with the capital formation required for expansion was not as large as during the 1950s. In the incipient structural crisis a large proportion of the Swedish engineers in the age group 30 - 35 years had acquired a very specific type of education. Even their practical experiences were, as it came to be known in the seventies, in the field of outdated activities. Thus, the Swedish engineers from the first half of the 1970s would have been better equipped to meet an economic structural crisis. It is also likely that the extent of the stock of engineers and its educational profile contributed towards the wrong type of investments during the beginning of the 1970s (shipbuilding, steel etc.). Thus, availability and access to competence forms a part of the basis for investment decisions.

III

Rolf Ohlsson's study, "Högre utbildning och demografisk förändring" (Higher Education and Demographic Change) has a wider scope and the theoretical points of departure are different from the two studies mentioned above. This study analyses the short-term and long-term changes in the annual flow to higher education during the period 1923-75. One point of departure in the study is that these changes can be primarily seen as a reflection of the changes in the individual demand for higher education while the capacity expansion only plays a secondary role. Since it can be assumed that social, economic and demographic factors have affected the individuals' choice between university studies and other activities in different ways, depending upon sex and earlier education, it was necessary to separate empirically certain groups and then study the annual enrollment for each group (male students, female students,

gymnasium engineers, gymnasium economists, foreign students, others). The annual number of students who entered the universities must also be seen against the background of how many who had the possibility to seek entrance to university studies. It was therefore essential to construct enrollment ratios for each group, i.e., the proportion of potential university students in each group who annually registered for higher education.

In an introductory descriptive survey it is observed that the changes in the total flow to higher education mainly depended upon the variations in the number of newly enrolled students from the general gymnasium. The proportion of females in this group had increased. It is further observed that the enrollment ratios from general gymnasium varied very substantially, both in the long run as well as in the short run. This is also true in the case of gymnasium economists and gymnasium engineers.

Subsequently the variations in the flow are analysed on the basis of a human capital explanatory model. According to such a model, the flow should vary in accordance with changes in the profitability of higher education. However, a collation of a large number of rate of return calculations for several occupational categories shows that a human capital theory based explanatory model rests on fragile empirical foundation. It can be noted that profitability during 1923-1968 had been high and stable, at the same time as the flow exhibits strong variations. In the study, this is interpreted as follows: a high rate of return on investments in education was a necessary but not sufficient condition for the changes which occurred during 1923-1968. This interpretation is supported by the fact that not only profitability but the flow as well decreased after 1968.

The subsequent section relates enrollment rates to the general income development in the society. Initially an effort is made to theoretically link incomes with an approach where education is seen as an investment, and not as consumption as it is usually done in the literature on economics of education. The analysis shows that the income development influenced the changes in the flow to universities but primarily indirectly. Incomes have been a strategic factor in the individuals' transfer from primary school to lower secondary school. On the other hand, when explaining the propensity to go from lower to higher secondary school and from higher secondary school to university, incomes cannot be cited as an important underlying factor. Nevertheless, certain discrepency between male and female student with regard to enrollment rates can be attributed to the income factor.

The most important section of the study deals with the possibilities of different information models to explain the variations in the enrollment. The formulation of information models within international research is progressing rapidly at present. Consequently, a systematic survey of the different models (signal, screening and sorting) is given in the study: common assumptions, relation to the human capital theory, international empirical studies, etc. On the basis of this survey it is clear that the sorting models can explain the emergence of a self-generating education inflation under certain conditions. Subsequently, this is linked with different theories which have dealt with the relationship between economic and demographic factors.

As a result the following hypothesis is formulated: the size of the age cohort to which an individual belongs determines his choice of the level of education. This is because education has an important sorting function.

As a basis for the hypothesis the following arguments can be given. The possibilities of firms to substitute older labour with younger labour are small. On the other hand, the substitution possibilities between different levels of education at the time of new recruitment are relatively large. This is linked to the fact that education has an important sorting function for the firms; a sorting which is particularly important with regard to the recruitment of large parts of the white-collar sector. The firms are primarily interested in the fact that the educational system ranks those seeking employment according to their inherent capacity. It is of no great importance whether the prospective employees have lower or higher secondary school examinations or academic examinations.

Since the substitution possiblities between younger and older labour are small, in any case in the shorter-term, the individuals who belong to a large age cohort will attempt to improve their relative position vis-a-vis others by demanding more education; this is done in order to gain access to the few, relative to the cohort's size, favourable employment opportunities.

Periods when the number of youths increases substantially will thus be characterised by an "inflation" in education. During periods when the youth cohorts decrease, the labour market conditions are favourable and this will result in a decline in the demand for higher education.

In a concluding section it is observed that there is empirical evidence to indicate that the size of age cohorts have influenced the demand for education, measured in terms of enrollment ratios. For enrollment ratios from upper secondary schools to university, strong correlation exits not only in the case of male and female students from the general upper secondary schools but also for students from commercial and technical upper secondary

schools. For enrollment ratios from lower to higher secondary school, there are weaker positive correlations. On the other hand, no relationship can be observed in the case of enrollment ratios from primary and secondary school. The incomes appear to have been a strategic factor for changes at this level, but the supply (the availability of educational facilities) has also been important in this context.

SOME CONCLUDING REMARKS

When the project was planned, we hoped to provide a more comprehensive analysis of the quantitative changes in the non-compulsory education in Sweden during the 20th century. Subsequently, however, it became clear that such an analysis was not possible within the frame work of time and resources at our disposal. We probably had a similar experience as others who have ventured into an almost new field of research; with each succeeding step the awareness that the path became longer increased.

Nevertheless, the project has resulted in new essential knowledge and we would like to particularly stress the following aspects. The project has brought out an extensive empirical material which, in essential respects, complements the official statistics. Furthermore, it has been clearly shown that it is necessary to emphasize the long-term development characteristics so as to better understand the central mechanisms. Our studies also indicate that the existing theories need to be modified. At the same time, much work remains to be done in this field.

The project's primary contribution has of course been the concrete economic historical analyses of three essential areas of problem; a) the importance of study financing for the social recruitment and educational expansion, b) the

linkage mechanisms between capital formation, labour market and the education market for a strategic occupational category and c) the importance of demographic factors for educational expansion. These studies should form a basis for a future comprehensive and integrated analysis of the quantitative changes within higher education.

Rolf Ohlsson
1985-03-07

REFERENCES

Nilsson, Anders (1977) "Study financing and expansion of education", *Economy and History*, Vol XV:2.

Nilsson, Anders (1984) *Studiefinansiering och social rekrytering till högre utbildning 1920-1977* (PhD dissertation, English Summary) (Lund: Studentlitteratur).

Ohlsson, Rolf (1985) *Högre utbildning, konjunkturer och demografiska förändringar* (Lund: Studentlitteratur).

Pettersson, Lars (1977) "Some aspects of the expansion of education in Sweden", *Economy and History*, vol XV:2.

Pettersson, Lars (1983) *Ingenjörsutbildning och kapitalbildning 1933-1973* (PhD dissertation, English Summary) (Lund: Studentlitteratur).

Pettersson, Lars (1985) "Svensk ingenjörsutbildning under efterkrigstiden mot bakgrund av teknisk och strukturell förändring", *Scandinavian Economic History Review*, nr 2.

Pettersson, Lars (1985) "Ingenjörsutbildningen i ett cykliskt perspektiv", *Forskning och utbildning*, nr 1.

BEST COPY AVAILABLE

GS Snabbtryck, Stockholm 1985